

## CLAIMS

What is claimed is:

1. A method for fabricating a forged titanium-alloy article, comprising the steps of

providing a workpiece made of a titanium alloy having a nominal composition in weight percent of 6 percent aluminum, 4 percent vanadium, 0.2 percent oxygen, balance titanium and impurities, wherein the titanium alloy has a beta-transus temperature; thereafter

forging the workpiece to make a forged gas turbine engine component, wherein the forged gas turbine engine component has a thick portion thereof with a section thickness greater than 2-1/4 inches; thereafter

heating treating the forged gas turbine engine component by

solution heat treating the forged gas turbine engine component at a temperature of from about 50°F to about 75°F below the beta-transus temperature, thereafter

water quenching the gas turbine engine component to room temperature, and thereafter

aging the gas turbine engine component at a temperature of from about 900°F to about 1000°F; and thereafter

final machining the forged gas turbine engine component.

2. The method of claim 1, wherein the step of providing the workpiece includes the steps of

preparing a melt of the titanium alloy, thereafter

casting the melt of the titanium alloy to form an ingot, thereafter

converting the ingot to a billet by hot working, and thereafter

cutting the billet transversely to form a mult that serves as the workpiece.

3. The method of claim 1, wherein the step of forging the workpiece includes the step of

forging the workpiece to make the forged gas turbine engine component selected from the group consisting of a compressor disk, a fan disk, and a gas turbine engine mount.

4. The method of claim 1, wherein the step of forging the workpiece includes the step of

forging the workpiece to make a forged compressor disk or a forged fan disk.

5. The method of claim 1, wherein the step of solution heat treating includes the step of

solution heat treating the forged gas turbine engine component for a time of from about 45 minutes to about 75 minutes.

6. The method of claim 1, wherein the step of water quenching is initiated within about 20 seconds of completing the step of solution heat treating.

7. The method of claim 1, wherein the step of aging includes the step of aging the forged gas turbine engine component for a time of at least about 4 hours.

8. The method of claim 1, including an additional step, after the step of forging the workpiece and before the step of heat treating, of ultrasonically inspecting the forged gas turbine engine component.

9. The method of claim 1, including an additional step, after the step of forging the workpiece and before the step of final machining, of ultrasonically inspecting the forged gas turbine engine component.

10. A method for fabricating a forged titanium-alloy article, wherein a thick portion of the titanium-alloy article has a section thickness of at least 2-1/4 inches,

comprising the steps of

providing a workpiece made of a titanium alloy having a nominal composition in weight percent of 6 percent aluminum, 4 percent vanadium, 0.2 percent oxygen, balance titanium and impurities, wherein the titanium alloy has a beta-transus temperature; thereafter

forging the workpiece to make a forged gas turbine engine component; thereafter heating treating the forged gas turbine engine component by

solution heat treating the forged gas turbine engine component at a temperature of from about 50°F to about 75°F below the beta-transus temperature, thereafter

water quenching the gas turbine engine component to room temperature, and thereafter

aging the gas turbine engine component at a temperature of from about 900°F to about 1000°F; and thereafter

final machining the gas turbine engine component, wherein the thick portion has a 0.2 percent yield strength of from about 120 ksi to about 140 ksi at its centerline, and a 0.2 percent yield strength of from about 160 ksi to about 175 ksi at a location about 1/2 inch below a surface thereof.

11. The method of claim 10, wherein the step of providing the workpiece includes the steps of

preparing a melt of the titanium alloy, thereafter

casting the melt of the titanium alloy to form an ingot, thereafter

converting the ingot to a billet by hot working, and thereafter

cutting the billet transversely to form a mult that serves as the workpiece.

12. The method of claim 10, wherein the step of forging the workpiece includes the step of

forging the workpiece to make the forged gas turbine engine component selected from the group consisting of a compressor disk, a fan disk, and a gas turbine engine mount.

13. The method of claim 10, wherein the step of forging the workpiece includes the step of

forging the workpiece to make a forged compressor disk or a forged fan disk.

14. The method of claim 10, wherein the step of solution heat treating includes the step of

solution heat treating the forged gas turbine engine component for a time of from about 45 minutes to about 75 minutes.

15. The method of claim 10, wherein the step of water quenching is initiated within about 20 seconds of completing the step of solution heat treating.

16. The method of claim 10, wherein the step of aging includes the step of aging the forged gas turbine engine component for a time of at least about 4 hours.

17. The method of claim 10, including an additional step, after the step of forging the workpiece and before the step of heat treating, of ultrasonically inspecting the forged gas turbine engine component.

18. The method of claim 10, including an additional step, after the step of heat treating and before the step of final machining, of ultrasonically inspecting the forged gas turbine engine component.

19. A forged titanium alloy article made from the process of claim 1.

20. A forged titanium alloy article made from the process of claim 10.